

Learning Conceptual Diversity through Caribou Co-management

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Introduction

The recognition of a diversity of conceptual systems is essential to any exploration of the links between social and ecological systems. This paper focuses on caribou co-management as a possible case study of the evolution of conceptual pluralism in practice. While acknowledging the significance of the political power dynamics between state and community, this discussion examines co-management from a different angle, that of learning and the accommodation of varied ways of knowing.

The question of how humans learn to learn and specifically how we learn to respect (not necessarily apprehend) other ways of knowing is represented here as an examination of humility - a respect for diverse realities. Humility is central to a needed dialectic or “new mode of conversation” (Bateson 1991:306), a veritable “economics of flexibility” of human thought (Bateson 1991:158).

Co-management literature describes co-management “inefficiencies” as the continued divergence in the attitudes and beliefs of state managers and community resource users (Kruse *et al.* 1998). Alternatively, co-management “failures” may signify the continued potential for the “successful” respect of conceptual pluralism. The lasting differences between the beliefs and attitudes of local resource users and state managers, may reveal much about the evolution of humility. For instance, continued differences between caribou users’ and government managers’ perceptions of caribou population dynamics (see Kruse *et al.* 1998) represents a significant epistemological problem - the reconciliation of different ways of thinking. Epistemologically-speaking, co-management may contain clues about how to overcome human beings’ deficit of *what* we are able to know and think (Bateson 1991:x) and in this century an increasing tendency to homogenize *how* we are able to know and think.

Currently, dominant global ideologies emphasize the “one-sided divorce, not only from nature but also from our own biology, and thus of course from our very selves” (Livingston 1981:82) leading to a mismatch between human behaviour and natural processes. This mismatch has strong implications for the human capacity to think about living processes and to act on this knowledge. In other words, *how* we

learn about social-ecological linkages is as important as *what* we learn about these links. Caribou co-management systems are examples of the negotiation of the mismatch between human behaviour and ecological processes. The discrepancy between the thought and belief systems of traditional caribou users and government caribou managers may lead to significant integrative and complex learning about human-environment relations rather than dominant ways of thinking marginalizing alternative thought.

First, this paper explores the limitations of all conceptual realities due to the nature of language and human thought patterns. The presuppositions of the most prevalent conceptual reality in the world today, western science, is also explored in relation to the nature of human language. Second, the paper examines co-management, specifically caribou co-management in arctic and subarctic North America, for evidence of the evolution of the trust and the humility necessary for the maintenance of diverse conceptual constructs. Third, the integrative nature of metaphor and belief systems and the relationship between resource management effectiveness and human purpose is outlined. Finally, it is suggested that the learning occurring in cross-cultural and mainly informal co-management settings may lead to the development of the humility necessary for the expression and adaptation of alternative and multiple metaphors, in essence, conceptual diversity.

Human Thought and Ecological Processes: The Pitfalls of Language and Science

Gregory Bateson, an American social scientist, spent the last years of his life looking at the mismatch between natural processes and human thought (Bateson and Bateson 1987). Bateson was concerned that the materialist framework of knowledge dominating ecological science leads to interpretive error, and as a result helps to deepen ecological crises. In attempt to correct for such interpretive error, he partially developed a theory of an integrative biological dimension of experience.

Bateson used a model of ‘mental process’ to describe the interaction of structure and process by abduction, a widespread phenomenon of human thought. Abduction is evident in metaphor, dream, parable, allegory, comparative anatomy, *etc.* (Bateson 1979:142). Mental process is a model he created in part as a tool for comparative study, bridging the gap between epistemology and ethics, and in part because he felt that occidental (western) languages do not lend themselves easily to the discussion of process *versus* structure. Bateson metaphorically described mental process as very large mental systems of ecological size or larger and the mentality of a single human being as a subsystem characterized by constraints in the transmission of information (news of difference) between the parts of the larger mental system (Bateson 1987:135).

Bateson acknowledged that every individual and every cultural, religious and scientific system has particular habits governing knowledge creation. However, he contended that most local epistemologies confuse “map”: (the domain of distinctions and differences) with “territory” (the physical domain which we can never perceive in its entirety) and assume that the rules for drawing maps (receiving news of difference) are immanent in the nature of that which is being represented in the map (Bateson 1987:21). To Bateson, this epistemological confusion of map with territory is the equivalent of believing that the “name is the thing named.” However, while we cannot “know” an individual “thing,” we can know something about the *relations* between things.

For Bateson, metaphor, not classification, is the logic upon which the biological world is built. The logic of metaphor identifies and connects all living processes rather than defining classes. In contrast, classical logic is only possible through language and ultimately limited because of its dependence on language, unavoidably structured by the discontinuous nature of description or “naming”. Bateson described epistemology not only as a tautology, an abstract system making sense in our own terms, but as natural history or the interface between map and territory. Bateson felt that one of the first steps to new ways of thinking about nature was to look at the limitations of any act of description (1987:144).

The Dene (Athapaskan peoples of the Canadian subarctic) concept of *inkonze* (Ridington 1990, Sharp 1997, Smith 1998), loosely translated as ‘little bit know something’ emphasizes the inferiority of human knowledge and power in comparison to ‘non-human persons’ or forces. *Inkonze* is a complex concept that in many ways Bateson echoes in his thinking about the dangers and difficulties of human attempts to describe and understand living processes. *Inkonze* emphasizes the experiential nature of life, where living and learning are intertwined and nature is the source of knowledge and power. As expressed by Tuan (1979) ‘knowing is an engagement with the world, rather than a reflection of the world,’ and echoing Levi-Strauss’ exploration of human-environment relations: ‘animals are not only good to eat, but good to think’.

Bateson equated structure with description and as a “spinoff of our perceptions and thought” (again, the name is never the thing named). In other words, the *Ding an sich* or “the thing itself” is equivalent to an “infinite of details” we can never fully describe or comprehend (Bateson 1987:164). Our descriptions of the world around us will always be marked by ‘gaps’ so that descriptions/ form/ structure are human constructs which are discontinuous or digital in character whereas process or the world of flux is continuous/ analogic. Again, just as the Dene concept of *inkonze* emphasizes the limitations and uncertainty involved in human understandings of reality, natural indigenous science “tends to reserve a

place for phenomena which are basically and fundamentally unsuitable for research and the knowable core gives strength to the knowledge system” (Roots 1998).

Description is obviously necessary if humans are to communicate their knowledge of living systems. However, Bateson focused on the role of extended metaphor (such as that of a vast mental process) as a way to consistently classify statements of description without denying the primary nature of process (Bateson’s “territory”) (1987:193). He felt that it was particularly important to study our descriptions, and our nature as information-processing creatures. He also thought the relationship between language and human reliance on learning and teaching as adaptive mechanisms, to be of crucial significance (1987:187). Bateson felt that until we understood the necessary limits of language and by extension science we would continue to ignore unavoidable epistemological problems. There are limitations to conscious human knowledge, and paradoxes produced by recursiveness and Bateson firmly believed that the correctives for errors implicit in human language and science lie in metaphor or narrative. Bateson did not hold any hope in solutions to “environmental problems” which fail to understand the limitations of description and the need to effectively incorporate the use of metaphor in order to achieve integrative and complex thought.

Bateson saw humankind’s path to ecological disaster as a systemic, epistemological problem (Bateson 1991). Mary Catherine Bateson (1991:x) summarizes this problem as:

... a destructive mismatch between human behavior and the characteristics of the biosphere within which human beings live and on which we depend. This is a mismatch rooted, not in the mistakes of particular chemists or the wastefulness of hunters or farmers, but in the human capacity to think about natural systems and act on that knowledge.

Co-management as Institutional Transformation: Learning Conceptual Diversity

Co-management is potentially an arena where human capacity to think about natural systems may be “remembered” and expanded. This may be achieved not only by respecting the metaphors or beliefs of local communities that inform the technical aspects of traditional knowledge and practice, but learned in institutions displaying a group consciousness foreign to most modern institutions. Caribou co-management institutions, have necessarily included the constant negotiation of fundamental concepts including those summarized in Table 1. This constant negotiation of meaning makes caribou co-management a dynamic process, a ‘conversation’ where interactive and mutual learning takes place, for example the long-standing interpretation of by whom, how and why resource crises are defined.

| |
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| TABLE 1: CARIBOU CO-MANAGEMENT: THE ONGOING NEGOTIATION OF MEANING |
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| Concept | Contrast of Meaning (Caribou Manager/User) |
|--------------------------|---|
| Conservation | <ul style="list-style-type: none"> • caribou as a depletable bank of resources <i>versus</i> • caribou as a ‘partner’ in a reciprocal relationship feeding not only economic needs, but spiritual, cultural and intellectual life and playing fundamental roles in social organization, kinship relations and cultural transmission |
| Management Effectiveness | <ul style="list-style-type: none"> • disparity between traditional caribou users and state management’s perceptions of acceptable monitoring and harvesting practices and notions of expert knowledge |
| Caribou-using Community | <ul style="list-style-type: none"> • homogeneous collective voice <i>versus</i> • heterogeneous settlement of people that moved seasonally; social and ecological contexts changed throughout the year until less than 40 years ago |
| Resource Crisis | <ul style="list-style-type: none"> • who/ how/ why defined? |
| Community Representation | <ul style="list-style-type: none"> • adequacy/ suitability/ shifting nature |
| Resource Use/ Allocation | <ul style="list-style-type: none"> • if all uses are not equal how are commercial/ recreational/ subsistence uses prioized so that categories of use recognize that subsistence harvesting may depend upon the wages earned through commercial uses? |

Feit (1998) describes co-management as the tension between state-mandated wildlife management regimes and the expertise of local resource users and the “social and political questions about how practices of recognition occur in contexts of power, dominance and resistance” (Feit 1998:124). Most of the co-management literature establishes and discusses these contexts or the power dynamics which are especially central to the linking of state and especially indigenous knowledge systems (Berkes *et al.* 1991, Campbell 1996, Lélé 1998, McCay and Acheson 1987, Osherenko 1988, Pinkerton 1989, Pomeroy and Berkes 1997). The problems of this power imbalance are well-illustrated in the ‘us-other’ cycle where the knowledge of ‘other’ societies is compared and measured against ‘our’ thinking as illustrated in Figure 1.

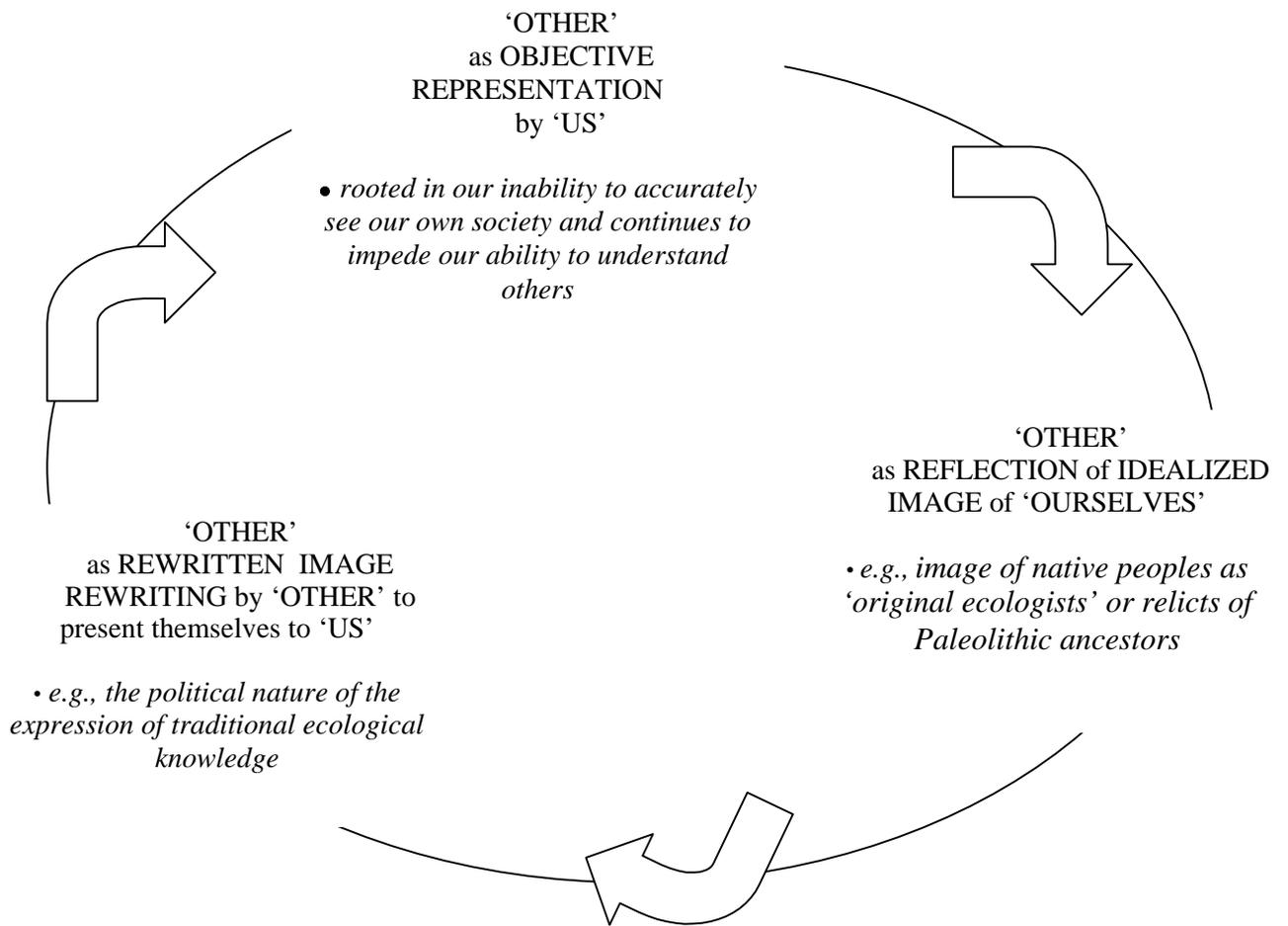


Figure 1: The ‘Us-Other’ Comparison of Knowledge Systems
Adapted from Fienup-Riordan (1990)

Perhaps because of this ‘us-other’ dynamic, co-management is pictured in a number of different ways in the literature, from a process of management devolution from state to local responsibility, to one of convergence between state and local management systems, to an image of compromise and finally, especially in the case of caribou co-management a model of community burden where the risks to communities of participating in co-management processes can be high (*i.e.*, community concerns that aboriginal rights and titles may be undermined). For this reason, co-management is not a panacea for the resolution of long-standing resource management conflicts, especially when there are considerable transaction costs endured by the indigenous societies who participate in these processes (Caulfield 1997, Kofinas 1998). However, while not denying that power dynamics are central to co-management decision-making processes, this discussion is an attempt to expand upon the concept of “trust between actors,” one of Berkes’ posed conditions for successful co-management.

These indicators of healthy co-management are listed below:

- 1) efficiency - minimal disputes and limited effort to maintain compliance

- 2) stability - capacity to cope with changes through adaptation
 - 3) resiliency - capacity to accommodate surprise and shocks
 - 4) equitability - shared perception of fairness among members
- (Adaptation from Caulfield (1997:9))

Equitability, or alternatively conditions of trust, will be unfolded here by examining evidence of *learning* - dependent on the mutual recognition of belief systems/ metaphor/ alternative narratives - by the parties involved in co-management. It is suggested that co-management analyses have largely ignored the potential development of innovative learning processes within (informal if not formal) co-management institutions because of an almost complete focus on political power dynamics. In an analogous manner, ecology largely focused on the competitive aspects of ecological relationships while marginalizing the study of the cooperative aspects of living relations, such as mutualisms, until relatively recently (see Berkes 1989, Rybczynski 1997). The importance of *informal* and *flexible* conditions allowing ‘double loop learning’ or frameshifts where the negotiation of the meaning of resource management can occur, are critical components of caribou co-management dynamics. It is suggested that the trust necessary for successful co-management involves the mutual recognition of the diverse learning systems participating in caribou co-management processes.

Caribou Co-management in the Canadian North

Caribou co-management provides a unique opportunity to explore the learning necessary for the respect of diverse systems of thought. Kruse *et al.* (1998) completed an extensive comparative study of the influence of caribou management history and beliefs on current caribou management effectiveness. The current incarnations of the two management systems Kruse examined, that of the Beverly-Qamanirjuaq (of northern Canada, hereafter the “Canadian” system) and Western Arctic (of Alaska, hereafter the “Alaskan” system) caribou herds, were initiated because these populations seemed to be encountering marked declines in the 1970s. These herds were subsequently shown to have recovered quickly or not to have declined to the extent first assumed, following the perceived “crisis” episodes of the 1970s (1998:449).

However, the legacy of these “crises” continues to reverberate in each management system. It is extremely difficult to separate differences in the belief structures between and among communities and the state from the schisms between state and community created by the uncertainties of early population survey techniques. It is in this history that the complexity of the issues surrounding the ‘who, what and

why' of the definition of resource crises can be illustrated. The history of the Canadian system is a unique example of an ongoing 'conversation' about the 'resource crises' and their real or socially constructed nature. The Canadian system's history also illustrates the enigma of attempting to define co-management successes. For instance, co-management institutions are examples of social interactions where 'what you don't see is as important as what you do see.' For example, the lack of protracted legal battles over monitoring and enforcement methods and increased environmental literacy caused by 'cross-checking' by co-management participants is as important to the definition of co-management success as any listing of the 'outcomes' of the process.

Remembering Resource Management's Place in a Framework of Human Meaning

There are dangers ladden in any measure of resource management effectiveness that does not acknowledge differences in human will or purpose. For instance, co-management effectiveness measures may reflect the ability of traditional caribou-using communities to conform to existing government management systems. Kruse *et al.* (1998) show that the majority of users perceive that the management regimes exist in order to control hunting in the event that the herds experience a decline. However, it is unimaginable that conventional contingency plans in the event of herd declines will be acceptable or indeed feasible given that state and community structures are largely mutually unintelligible. The lack of recognition of the 'customary practices' of caribou-using communities is often couched in a lack of context or understanding of the history of human-caribou relationships. Just as wildlife population dynamics change, the human-caribou dynamic has shifted dramatically in the last century. In a comparison of human-*Rangifer* relationships across the circumpolar North, Anderson (1999:34) asks, "when we know that the history of human communities have changed, is it reasonable to assume that the identity and quality of *Rangifer* populations have not changed?"

In addition, there are problems inherent in caribou research that attempts to understand the very complex and unpredictable ecology of caribou through methodologies that simplify human-*Rangifer* relations :

If *Rangifer* behaviour and population discreteness is a responsive trait, as indigenous hunters assert, then it is entirely possible that the last few decades of controlled predation ... as well as 'rational use' ..., have cultivated a historically unique ecotype of *Rangifer*.
(Anderson 1999:35)

In a description of historical Dene movements, Smith relates that :

Visiting between local and regional bands was common ... information on shifting herd movements would be widely known. The distribution of hunting groups may be viewed in terms

of the anticipated dispersal of caribou ... The apparent breakdown of the network about 1950 was a consequence of a new phase in the late contact-traditional era ... indicative of a greater degree of sedentism.
Smith (1978:82)

This line of argument is not meant to imply that the relationship between caribou hunting communities and caribou is somehow 'lost' or irrevocably 'damaged.' Communities are very conscious of the dramatic changes in this relationship, and that the caribou of today are not the same as the caribou at the turn of the century, anymore than caribou hunters are the same as the hunters of the early 20th century.

The history of human-caribou relations also informs the differences between manager and user perceptions of harvesting practices and research methods. A survey of acceptable harvest practices reveals that in both the case of the Alaskan and the Canadian caribou management regimes mentioned above, consensus between users and managers exists on only half of the harvest practices discussed (Kruse *et al.* 1998:453). There is much less agreement on acceptable research monitoring practices (see Ferguson and Messier 1997, Kofinas 1998). There are again considerable differences in the cultural beliefs among the user communities represented by the Canadian and Alaskan systems (Kruse *et al.* 1998, Kendrick 1994). The differences in the perceptions of users and managers are marked by a paradox. While managers believe that their knowledge is clearer to users than it was during the "crises" of the 1970s, users do not agree (Figure 2).

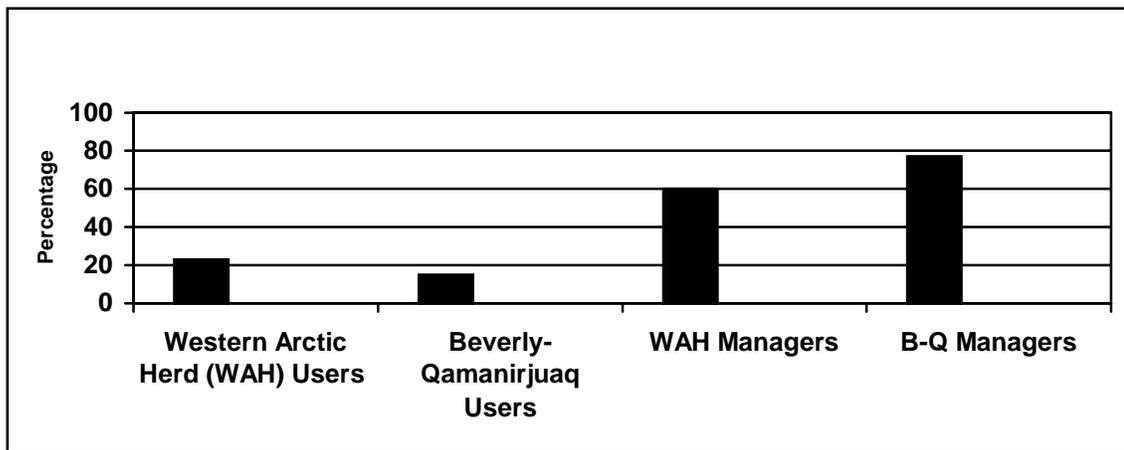


Figure 2

Of the opinion that users more likely to believe biologists now than in the 1970s

(From Kruse *et al.* 1998:454)

For instance, users appear to interpret changes in the prevalence of caribou as a matter of location, not changes in herd size (Berkes 1999, Freeman 1989, Kendrick 1994, Kruse *et al.* 1998, Urquhart 1996, Ferguson and Messier 1997).

The Chipewyan [Dene], themselves explain the periodically scarce numbers of caribou in their hunting ranges differently. A wide-spread tradition holds that caribou never die, unless killed, but if one is captured or mistreated his spirit will go to the others and warn them to remain away from the area ... [t]he decline in caribou numbers in the 1950s and 1960s coincided with the onset of serious caribou studies by the Canadian Wildlife Service. The Chipewyan attributed the decrease in caribou in this area to the capture and tagging, which caused the caribou to avoid the area, rather than to any real decline in numbers.

(Smith 1978:72)

This is not to imply that local knowledge systems recognize changes in pattern and qualitative observations to the exclusion of quantitative observations of change. Similarly, Holling's (1998) commentary on the two cultures of biology is not meant to imply that science focuses on the description of reductionist quantitative patterns to the exclusion of integrative thought.

The connection between self-determination and resource management in the Canadian North (Caulfield 1997, Nuttall 1998) cannot be over-emphasized. Attempts to control harvesting activities run to the heart of these user communities and are potentially as devastating to community identity and self-determination as any other process of acculturation (see Ames 1979, Bussidor 1997, Kendrick 1994). It is very telling that among Canadian managers, 87 percent feel that the co-management board has increased users' sense of control, whereas only 27 percent of users feel the same way. Two-thirds of Canadian managers think that user involvement is as great as it needs to be, whereas less than one-third of users feel the same. In contrast, almost all (94 percent) Alaskan managers and significantly less users (two-thirds) would like to see increased user involvement (Kruse *et al.* 1998). Evidently, users and

managers have different perceptions of the appropriate level of caribou user participation in co-management processes.

While self-determination is of fundamental importance to this discussion, Kruse's finding that neither the Canadian nor the Alaskan systems have found effective mechanisms for incorporating user and manager observations is highly significant. This is because of the potential cognitive differences between the knowledge of users and managers. Managers comment that user observations are often difficult to interpret and a divergence in user and manager views stifles efficient action. Simpson (1999:74) surmises that:

By reducing processes into factual data, much of the power of Indigenous Knowledge is lost. The dominant society is willing to use Indigenous generated factual data in co-management agreements, but they are not willing to use the *process* of Indigenous management. Instead of strengthening and using Indigenous processes, the dominant society inserts factual knowledge into its own processes, models and management plans. The ability of Aboriginal peoples to affect change in environmental management then becomes greatly reduced.

What doubly surprised Kruse's team about their comparative study, however, was the finding that Canadian government managers do not place a higher value on indigenous knowledge despite their participation in a formal co-management regime in comparison with Alaskan managers who are not party to a co-management regime. Kruse's results reveal that a higher proportion of users would cooperate with managers in Alaska than in the Canadian situation. Kruse implies that this may be related to the time that Alaskan users and managers spend together on a day-to-day basis - essentially it appears that the informal social relations between state and community are the influences that lead to real, but informal institutional change. It is the informal and flexible nature of co-management institutions that catalyze a social learning 'chain reaction' (Figure 3).

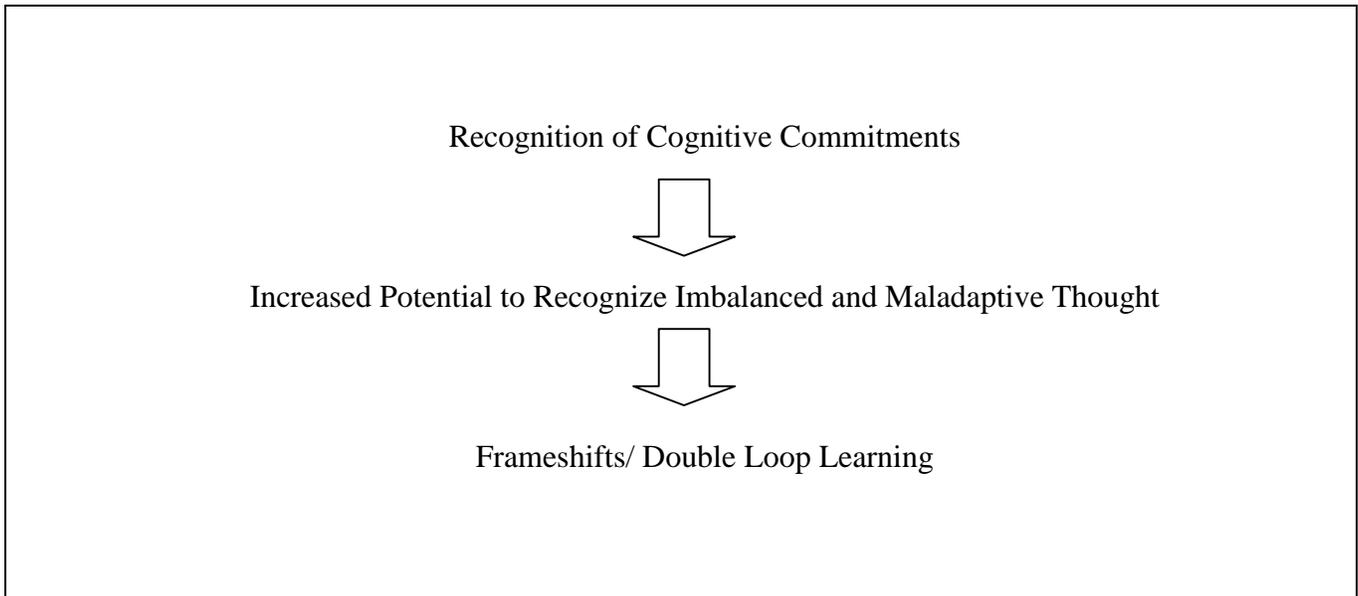


Figure 3

The 'Chain Reaction' of Informal and Flexible Institutions

Fienup-Riordan's (1999) recent work with Yup'ik communities in Alaska confirms the importance of the social connections between state and community. Without the development of personal connections, collaborative work between communities and the state remains limited in scope. As expressed by one Yup'ik elder (Fienup-Riordan 1999:19): "There are different kinds of biologists. Some stick with what they know, they don't try to expand their knowledge. There are the others who want to learn more and expand their knowledge to help us."

Managers *and* users do recognize the *potential* of reformed management regimes. However, government managers and traditional users may *recognize different potentials*. The clash of perceptions of users and government managers during the caribou "crises" of the 1970s may be more fundamental than we have even begun to realize. *Formal* co-management institutions still treat community-based resource management as something so unfamiliar as to make it non-existent to formal co-management practices.

‘Cognitive Commitments’

Any analysis of caribou management effectiveness should ask how caribou management affects not only community-based property rights systems, but cognitive systems for understanding natural processes. Conventional management measures (*i.e.* limiting harvest rates) may be achieved only at the expense of significant short and long-term social costs and with minimal understanding of the natural processes regulating caribou numbers and the viability of caribou populations. Most likely a re-examination of the presumptions made by the state and academics about the cognitive structures and premises enveloping local knowledge systems is needed.

State management knows very little about the ways that caribou users currently share (and shared before year-round settlement patterns) information about the location and movements of caribou (see Burch 1991, Speiss 1979). Pre-contact First Nation harvesting levels were *not* limited *solely* by low population numbers and inefficient technologies (see Berkes 1999, Csonka 1991). It is possible that the hesitancy of communities to accept the methods and technology of caribou population surveys is also related to the ways in which such research may threaten local knowledge exchange systems.

Hunters in some settlements use citizen’s band (CB) and high frequency (HF) radios to communicate with people on the land or in communities hundreds of miles away about wildlife movements (Nakashima 1991, Kendrick 1994). It could be argued that radios help to replicate the knowledge exchange which seasonal movements and the large gatherings of individuals for events like caribou corral drives must have fostered in the past.

There are remarkable parallels in past caribou hunting techniques across the circumpolar region including “mass traps” such as corrals with drive fences or drives of animals into water bodies (Speiss 1979:134). These structures appear to indicate that the knowledge of the spatial and temporal behaviour and movements of wildlife of those societies even marginally dependent on caribou was extensive. Ethnohistorical records show that “regional bands” of between 200 to 400 people (“Caribou Eater Chipewyan” and Yellowknife Dene) gathered for the sole purpose of “communal” hunts at drive fences in the fall and winter (Speiss 1979:115). Even brief consideration of the complexity involved in coordinating these hunts should give us pause about the knowledge and communication involved.

Co-management efforts are not only increasing state managers’ awareness of the existing sharing and kinship relations involved in country food distribution, but also of the knowledge exchange occurring at a local level. Notions of “sharing,” “equity” and “reciprocity” are very different in Dene and Inuit belief structures *versus* state bureaucracies, especially when principles of knowledge sharing

versus resource use rights are examined. The examples listed in Table 2 further illustrate the depth of the concepts currently negotiated in co-management contexts and the difficulties inherent in translating between languages, and between conceptual realities. For example, in Dene reality, time and space join in ways understandable only from the standpoint of a five or six-dimensional model (Sharp 1997:97). The reality of time created by *inkonze* is more similar to Western concepts of space. Time is a variable rather than a fixed point so that “history is not past, history is; future is not maybe, future is; both are equally real.” (Sharp 1997:97). This concept of time is a huge contrast to Western thinking where time is organized into a linear sequence and causality is an implied part of this sequence (the classical definition of logic). Time moves in a direction from a determined past to an undetermined future so that only ‘now’ is real (Sharp 1997:97). It is obvious that if Dene conceptions of time are more closely related to Western ideas of space, there are huge differences between these realities and the realization of these differences makes caribou co-management an ominous task.

TABLE 2: THE LINKS BETWEEN CONCEPTUAL REALITIES AND LANGUAGE

| Resource Managers and Biological Scientists | Term | Dene Hunters and Elders |
|--|-----------------------|---|
| <ul style="list-style-type: none"> • discrete population of animals displaying long-term fidelity to a definable calving area and subject to abundance and scarcity | <i>Caribou Herd</i> | <ul style="list-style-type: none"> • groupings of animals whose behaviour and discreteness is responsive to human-caribou interactions or a relationship of collaborative reciprocity |
| <ul style="list-style-type: none"> • resource that is a biophysical component of habitat that supports populations | <i>Land</i> | <ul style="list-style-type: none"> • <i>nde</i> - a living entity encompassing a holistic notion of living; a landscape complete with animals, plants, and other living processes with spiritual lives |
| <ul style="list-style-type: none"> • time is linear/ space is 3-dimensional and impersonal | <i>Time and Space</i> | <ul style="list-style-type: none"> • time and space join in a five or six-dimensional model (Sharp 1997:97) • time is a variable rather than a fixed point so that the past, present and future are current |

| TABLE 2 (Continued) | | |
|--|--------------------------|--|
| Resource Managers and Biological Scientists | Term | Dene Hunters and Elders |
| <ul style="list-style-type: none"> • caribou as a ‘resource’ that can be managed and belief in control and rational explanation; belief that population dynamics can be manipulated | <p><i>Management</i></p> | <ul style="list-style-type: none"> • the word is non-existent in Dene languages, however the concept of <i>inkonze</i> illustrates the fundamental differences between the scientific human-nature split and <i>inkonze</i>’s recognition of human dependence and place ‘in’ nature • the human-nature relationship is one characterized by ethics, and reciprocity, but not by ‘management’ • acceptance of uncertainty, uncontrollability and unknowability |

Moreover, Kofinas’ work (1998) illustrates that it may be detrimental to communities to fully engage themselves with state institutions which may decontextualize community structures and knowledge to such an extent that they are no longer meaningful or viable (see Weinstein 1996). The recognition of the continued dynamism of community knowledge processes must be made before we can understand the diverse motives underlying state *versus* community resource management (see Feit 1998).

Learning to Recognize Diverse Knowledge Systems

In recent years, co-management initiatives have stepped up efforts to complement the “traditional ecological knowledge” (TEK) of resource users with the science of resource managers. As a result, comparisons are made between the “content” of different knowledge systems. There are dangers inherent in a discussion prone to the comparison and contrast of knowledge systems and world views. Within these comparisons it is easy to forget that “what we know” is framed by “how we know”. Existing “differences in ways of knowing” may represent the relations possible between different knowledge systems. Alternatively, comparisons between systems - usually in the form of dichotomies - may be traps, and represent knowledge systems best left differentiated. It is in this distinction that the need for humility lies.

Many scholars claim that since Cartesian times, Western society has marginalized the science of the integration of the parts in favour of the prescriptiveness offered by the science of the parts (Bateson 1991, Capra 1996, Holling 1998). Holling (1998) describes the “two cultures of biological ecology” as the analytical *versus* integrative approaches. We have trivialized the exploration of the integrative approach and misapplied the reductionistic approach to such an extent that we have forgotten the “... inherent unknowability, as well as unpredictability, concerning ecosystems and the societies with which they are linked... [and the] inherent unknowability and unpredictability to sustaining the foundations for functioning systems of people and nature.” (Holling 1998).

However, other scientists point beyond the *imbalances* in the *application* of the “two cultures of biological ecology.” Bateson (1991:199-201) outlines the *misleading orthodoxies* of the natural sciences. Namely, the

- 1) artificial isolation of the observer from the object observed
- 2) false sense that time is independent of process, when in fact time is a consequence of process
- 3) misapplied logical typing that makes structure primary and process secondary in mainstream society.

The comparisons made between “TEK” and “Western science” are often one conceptual process’ (Western science’s) attempts to redress the imbalances and misleading orthodoxies it increasingly recognizes in itself, or simply reminders of forgotten presuppositions. This construction of TEK as a sounding board for applied western science runs the risk of homogenizing and perhaps even silencing the varied and diverse conceptual realities now labelled as IK or TEK (see Agrawal 1995, Cruikshank 1998). Clément (1998:12) states that:

some of the people using TEK do so on the false basis of a comparison between a selected part of Western societies’ knowledge, *i.e.* “science,” and the whole of a culture which is regarded as knowledge.... Such opinions are stated when it is quite clear that science without intuition would be nothing; that many scientists were strictly moral and religious; that the discoveries of Einstein would not have been made had Einstein not believed in a principle of divine harmony; that Indigenous people have hierarchical classification; and that the same people always, and I say always from my own experience, count the number of fish or whatever they catch in a season, and that they are not merely qualifiers of nature but also quantifiers.

In this way, the TEK-Western science dichotomy can be an illusion that co-management regimes may or may not identify and avoid. Real innovation in thought may be discovered in resource management approaches that concentrate instead on recognizing cultural differences in learning patterns.

How Something is Known is as Important as What is Known

The manner in which knowledge is interpreted or learned is as important as the ways in which it is produced or transmitted. Animism and shamanism, “described as among the most significant characteristics of northern cultures ... [and the] least analyzed...” (Yamada and Irimoto 1997) may be viewed as systems of thought and practice articulating the associations between human will and environmental potential (Irimoto 1997, Ridington 1990:96).

Anthropologists working in northern Canada have explored this idea (Ridington 1990, Cruikshank 1998, Bielawski 1992, Rushforth 1994, Sharp 1997, Smith 1998). Mythic beliefs and practices are a form of technology - a system of knowledge - artifice or process rather than artifact. Ridington argues that Levi-Strauss’ *science du concret* is equivalent to mythic thinking which in turn represents only a part of a culture’s overall adaptive strategy. In essence, much traditional ecological knowledge research separates the technical knowledge of a culture from its place within a network of adaptive relations.

Bateson, referring to the work of Freud and Pascal remarks that conscious thought and by association the actions we take as a result, are deeply influenced by the workings of the unconscious. In Pascal’s words: “le cœur connaît les raisons que le raison ne connaît point.” Parson and Clark (1995 in Gunderson) describe this difference in the nature of learning as the movement of knowledge between the explicit or conscious form and the implicit or “tacit” realm of knowledge.

Ridington’s work with Dunne-za communities reveals that mythic thinking, story-telling, dreaming, and ceremonial activities, that members of western society might refer to as artistic or ritualistic activities, serve a fundamental integrative purpose, linking the “conscious and tacit realms of knowledge” of the individual *and* collectively of a society. Cruikshank (1998) shows how Yukon First Nation story-tellers use narratives to raise significant epistemological issues about Western classificatory practice and contemporary theoretical constructions. For example, when state resource management regulations changed Dene hunting realities so that a Dene elder asks, “So, if ‘subsistence’ means ‘food,’ and ‘nonsubsistence’ means ‘culture,’ how do you get a swan bone for a ceremony?” (Cruikshank 1998:17) a fundamental question is being asked: How do Dene continue to observe hunting practices that respect the reciprocity inherent in human-environment relations when Western resource management marginalizes meaning by focusing exclusively on explanation (belief in deterministic world). Moreover, stories, and ceremonies play a role in linking human history (of human-environment relations) to a sense-of-place so that when “[o]ld people they tell you a story, you’ve got to listen. When

you don't listen, you're going to be crazy. You're going to be crazy, and you're not going to live long." (Cruikshank 1998:19).

How is the marginalization of integrative learning and the narrowing of consciousness affecting the relations between human purpose and environmental potentials? We have looked at caribou co-management as a case study example of the clash of different views of human purpose and perceptions of environmental potentials.

Conceptual Diversity: A Matter of Respect or Comprehension?

The cross-cultural translation of knowledge systems, never mind adaptive strategies, is an ominous task. What happens, for instance, within caribou co-management regimes when the policies of northern governments require the inclusion of TEK within management decision-making and monitoring activities? When a biologist or social scientist collecting TEK marginalizes the dances, songs or stories associated with the technical knowledge (s)he extracts from conversation (without knowledge of the metaphor or context these expressions represent), learning or respect of another way of knowing is potentially lost or at the very least marginalized. As McCulloch - an early thinker in the cybernetics movement - frames it, too often we fail to recognize that occidental cultures have developed a habit of ignoring the "background" or context which is in fact the "operator" in an interaction, and selectively placing the "operands" in the foreground believing that these parts can be understood distinct from their contexts (Bateson 1991:66).

In a series of films recording the thoughts of Inuit hunters and caribou biologists in the Keewatin region (west coast of Hudson Bay) in the late 1970s, one hunter stated,

I think that they [Inuit hunters and state biologists] would stop disagreeing with each other if they both started showing things in a way that doesn't make the other person look bad but so that the other person or party understands what the other is trying to do about the caribou. (NFB, video tape #8(1)).

Surely, this is a recognition of the importance of knowing the context from which a knowledge-holder speaks, the context of communication between human beings, if not even the communication within a larger biological system that includes human beings.

Reconciling Diverse Metaphors

The work of oral historians indicates that with the increasing marginalization of orality we are losing the ability to resist maladaptive orthodoxies (see Cruikshank 1998), such as economic systems that

externalize natural processes. We may also be concentrating the power to express maladaptive orthodox metaphors. For example, Rushforth (1994) illustrates that the Bearlake Dene's preference for experiential knowledge is a local means of resistance of outside systems of knowledge which threaten Bearlake beliefs about knowledge, truth and authority. Modern social systems - such as state wildlife management - are abstract systems based upon impersonal principles independent of place - such that the exchange of information within these systems of knowledge is disembodied across time and space (Rushforth 1994).

The knowledge of modern expert (abstract) systems of knowledge and "premodern" local systems of knowledge is premised on very different notions of trust. As phrased by Rushforth, "modern trust rests on blind faith in impersonal abstract principles of which people are largely ignorant" (1994:344). Premodern trust is "founded on social connections and co-presence" (Giddens 1990 in Rushforth 1994:344).

Bateson argues that the very human consciousness that has allowed us a level of flexibility and survival unknown to most species, has also led to maladaptations of action and thought. Conceptual prejudices include the "mind-body dichotomy," or a continued persistence in describing process as a product of structure rather than structure as a 'snapshot' of process. Additionally, Tuan (1977:119) points out that people "differ in their awareness of space and time and in the way they elaborate a spatio-temporal world" and adds "the possibility that the environment itself may have an effect on the elaboration." Is the human elaboration of our awareness of space and time fundamental to our place in nature? Is this elaboration in any given culture a convenient heuristic that helps to order our lives or a kind of 'dialogue' with Bateson's large 'mental process' that informs our elaboration?

Language simultaneously safeguards us from the transfer of unsound learning while also allowing us to detach ourselves from sound learning (see Hendrix in Bateson 1991: 106-113). However, we disregard the ambivalent quality of language and by association purposive communication (Bateson 1991:113). We have somehow overemphasized the process that allows us to detach ourselves from unsound learning and increasingly ignored the signals of corrective feedback learning. This is true not only at an individual level but magnified at an institutional level.

Earlier we looked at the discrepancies between the attitudes and belief systems of caribou-using communities and state caribou managers as an example of the ineffectiveness of caribou co-management efforts (Kruse *et al.* 1998). No doubt, cooperative management *action* is difficult because of the continued differences between state managers and caribou users despite almost two decades of direct

dialogue. However, it is here that encouraging conditions for the learning of resilient thought processes, or an expanded capacity to recognize the diversity of what we can know as well as *how* we can know and understand natural processes.

Kruse's finding that caribou-using communities have significantly different notions of caribou population dynamics than caribou biologists has the potential to charge rather than diffuse co-management prospects. Caribou biologists are still coming to grips with issues like 'herd discreteness,' 'range use,' the periodicity of population cycles, and the effects of human disturbance activities on caribou behaviour and viability. Although 'conceptual diversity' is a term increasingly explored by scholars in theoretical treatises, the practice and development of conceptual diversity is little understood in practice.

For example, the persistent belief of Inuit, Cree and Dene elders (among others) that caribou will return to an area they once frequented despite biological evidence that a population crash has occurred is not necessarily representative of the limitations of local thought. This belief *may* be representative of a metaphor or conceptual reality where humans cannot or do not break or inappropriately interfere with natural cycles or processes. Scholars describe the ways in which 'modern' knowledge is disembedded from place and people, while 'premodern knowledge' is embedded in space and social connections (Berkes 1995). Modern knowledge appears, however, to be highly embedded in an image of human potential where natural processes are marginalized. Not only is this human-environment division entrenched, we behave as though natural processes are incidental to human life, in essence as though we are not biological organisms.

To restate, there may be exciting lessons learned from the very differences in perceptions between caribou users and state managers that are currently described as indicators of management ineffectiveness. Where Inuit and Dene elders question the reality of population 'crises' and the necessity of handling wild animals outside of the respect and reciprocity of harvesting relationships, we may be seeing evidence of a consciousness that emphasizes the primariness of relations over structure or Bateson's 'mental process.'

However, caribou biologists are understandably worried about the results of maladaptive human actions on the viability of caribou populations. Where First Nation elders may find it incomprehensible that human beings are capable of disrupting or destroying cyclic processes (see Fienup-Riordan 1999, Kofinas 1998) - and many scientists would agree, human life may not endure the ecological destruction we are now experiencing, but we are unlikely to destroy all life - scientists increasingly understand that

human ignorance of natural processes is leading to large scale pathologies. These pathologies have been characterized broadly as a ‘typology of ignorance’ that is most difficult when it is an ‘unperceived ignorance’ where ‘we *don’t* know that we don’t know.’ However, this typology of ignorance is inexcusable when we insist on reacting to environmental crises backwards, by continuing to apply inappropriately the technology derived from science when ‘we *do* know that we don’t know’ (Bateson 1991).

Summary and Conclusions

Caribou co-management initiatives have fostered a questioning of the manner in which scientific research questions are framed (Ferguson *et al.* 1998, Kofinas 1998, Urquhart 1996). As expressed by Berneshawi (1997:134), “...mutual education is a tool for re-education and redressing what people think they know.” Thomas and Schaefer (1991) refer to the results of this mutual education process as a fundamental reform of attitudes, both of government and community representatives. Co-management success is not easily expressed, it represents a dynamic process whose outcomes are difficult to describe. Evidence of slow learning is taking place in caribou co-management settings, but not yet necessarily in a way that ensures that both community and state equally share the costs of this process that in many ways represents a cognitive transformation (Caulfield 1997, Feit 1998, Kofinas 1998).

Caribou co-management may represent an emerging dialectic of conceptual diversity in practice. However, the trust and humility involved is complex and is fostered in arenas beyond the rigid frameworks of formal co-management processes. The differences in the knowledge of caribou biologists and hunters may involve more than the spatial or temporal contexts of the knowledge (*i.e.*, synchronic *versus* diachronic observations). There may be fundamental differences in the acknowledgement of the primary nature of process *versus* structure or the ability to tap into the corrective measures of learning preventing the ‘typology of ignorance’ evident in dominant resource management practices.

The resilience of human abilities to think about natural processes may lie in learning how to challenge maladaptive orthodoxies, but to do this we must better understand the interaction between structure (human construct) and process. Without metaphors that allow us to classify structure in consistent and integrative ways, attempts to respect and support knowledge systems based upon fundamentally different metaphors may not only distort or ignore viable ways of thinking, but altogether destroy them.

Learning to respect difference does not lie in the codification of knowledge systems (Cruikshank 1998, Feit 1998, Nuttall 1998, Simpson 1999). Adaptive action recognizes the paradox or double bind of respecting diversity, but not connecting differences in knowing in a manner that homogenizes or misclassifies thought. The dangers of homogenization and misclassification is represented by scholarly focus on the technical aspects of TEK and the subsequent marginalization of the voices (cognitive as well as political) inherent in local knowledge systems. If we are to think and learn in adaptive manners, then world views or metaphors that allow integrative and complex thinking need to be supported rather than deconstructed and remember that "... [m]etaphor rejects: whatever can be definitively named ... and, as a result, directly apprehended. Such naming is 'vital' to human understanding, but it is also 'arrogant, fatal, [and] dominant to ascribe names - to resort to literal language - is to participate in what might be called the *fixing* of knowledge." (Seitz 1999:2). By focusing *only* on the codification of knowledge, we risk eliminating the resilience of the human capacity to know in integrative and complex ways.

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